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AC Induction / Reversible Motor All Series User's Manual

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1.Precautions

◆Precautions of installation

●Do not use in a place where is flammable gas or corrosive gas.

●When installing motor into your equipment,ensure that the motor lead wires are fixed and not move. In addition,do not apply any pressure to these lead wires.

●Motors for use only in equipment of protection class I.

●The motor housing must be mounted with screw and spring washer to the ground point of the equipment.

●Installation must be performed by a qualified installer.

◆Precaution of operation

●The motor case temperature can exceed 70℃.

●In case motor is accessible during operation,please attach the following warning lable so that it is clearly visible.

Warning label

2.Verifying the product name and package content

◆Checking the contents

Make sure that you have received all of the items listed below.

If an accessory is missing or damaged,contact the nearest local seller.

●Motor…..1 pc ●Capacitor……1pc(for only single phase motors) ●Capacitor cap……1pc

●User's manual…..1

◆Checking the product name and motor- capacitor combination

When the product first arrives,check the name plates to confirm that you have received the correct motor and capacitor combination.

2.1Induction/Reversible motors

■Induction motors—6I、8I、9I series

Shaft	Power	Voltage	Model	Capacitor	Shaft	Power	Voltage	Model	Capacitor
Round shaft	6W	Single phase 110/115	6I6S-1	2.5μF/250V	Pinion shaft	6W	Single phase 110/115	6I6P-1	2.5μF/250V
		Single phase 220/230	6I6S-2	0.6μF/450V			Single phase 220/230	6I6P-2	0.6μF/450V
		Three phase 230	6I6S-3	—			Three phase 230	6I6P-3	—
	25W	Single phase 110/115	8I25S(B)-1	6.5μF/250V		25W	Single phase 110/115	8I25P(B)-1	6.5μF/250V
		Single phase 220/230	8I25S(B)-2	1.5μF/450V			Single phase 220/230	8I25P(B)-2	1.5μF/450V
		Three phase	8I25S(B)-3	—			Three phase	8I25P(B)-3	—

		230					230		
		Three phase 380	8I25S(B)-8	—			Three phase 380	8I25P(B)-8	—
	40W	Single phase 110/115	9I40S(B)-1	10μF/250V		40W	Single phase 110/115	9I40P(B)-1	10μF/250V
		Single phase 220/230	9I40S(B)-2	2.5μF/450V			Single phase 220/230	9I40P(B)-2	2.5μF/450V
		Three phase 230	9I40S(B)-3	—			Three phase 230	9I40P(B)-3	—
		Three phase 380	9I40S(B)-8	—			Three phase 380	9I40P(B)-8	—
	60W	Single phase 110/115	9I60S(B)-1	18μF/250V		60W	Single phase 110/115	9I60P(B)-1	18μF/250V
		Single phase 220/230	9I60S(B)-2	4μF/450V			Single phase 220/230	9I60P(B)-2	4μF/450V
		Three phase 230	9I60S(B)-3	—			Three phase 230	9I60P(B)-3	—
		Three phase 380	9I60S(B)-8	—			Three phase 380	9I60P(B)-8	—
	90W	Single phase 110/115	9I90S(B)-1	20μF/250V		90W	Single phase 110/115	9I90P(B)-1	20μF/250V
		Single phase 220/230	9I90S(B)-2	6μF/450V			Single phase 220/230	9I90P(B)-2	6μF/450V
		Three phase 230	9I90S(B)-3	—			Three phase 230	9I90P(B)-3	—
		Three phase 380	9I90S(B)-8	—			Three phase 380	9I90P(B)-8	—
	135W	Single phase 110/115	9I135S(B)-1	27μF/250V		135W	Single phase 110/115	9I135P(B)-1	27μF/250V
		Single phase 220/230	9I135S(B)-2	8μF/450V			Single phase 220/230	9I135P(B)-2	8μF/450V
		Three phase 230	9I135S(B)-3	—			Three phase 230	9I135P(B)-3	—

■Reversible motors—6R、8R、9R series

Shaft	Power	Voltage	Model	Capacitor	Shaft	Power	Voltage	Model	Capacitor
Round shaft	6W	Single phase 110/115	6R6S-1	3.5μF/250V	Pinion shaft	6W	Single phase 110/115	6R6P-1	3.5μF/250V
		Single	6R6S-2	0.8μF/450V			Single	6R6P-2	0.8μF/450V

		phase 220/230					phase 220/230		
	25W	Single phase 110/115	8R25S(B)-1	8μF/250V		25W	Single phase 110/115	8R25P(B)-1	8μF/250V
		Single phase 220/230	8R25S(B)-2	2μF/450V			Single phase 220/230	8R25P(B)-2	2μF/450V
	40W	Single phase 110/115	9R40S(B)-1	12μF/250V		40W	Single phase 110/115	9R40P(B)-1	12μF/250V
		Single phase 220/230	9R40S(B)-2	3.5μF/450V			Single phase 220/230	9R40P(B)-2	3.5μF/450V
	60W	Single phase 110/115	9R60S(B)-1	20μF/250V		60W	Single phase 110/115	9R60P(B)-1	20μF/250V
		Single phase 220/230	9R60S(B)-2	5μF/450V			Single phase 220/230	9R60P(B)-2	5μF/450V
	90W	Single phase 110/115	9R90S(B)-1	30μF/250V		90W	Single phase 110/115	9R90P(B)-1	30μF/250V
		Single phase 220/230	9R90S(B)-2	7μF/450V			Single phase 220/230	9R90P(B)-2	7μF/450V
	135W	Single phase 110/115	9R135S(B)-1	27μF/250V		135W	Single phase 110/115	9R135P(B)-1	27μF/250V
		Single phase 220/230	9R135S(B)-2	8μF/450V			Single phase 220/230	9R135P(B)-2	8μF/450V

2.2 Speed control motor-Component type

■Speed control motor—6I、8I、9I series

Shaft	Power	Voltage	Model	Capacitor	Shaft	Power	Voltage	Model	Capacitor
Round shaft	6W	Single phase 110/115	6I6SV-1	2.5μF/250V	Pinion shaft	6W	Single phase 110/115	6I6PV-1	2.5μF/250V
		Single phase 220/230	6I6SV-2	0.6μF/450V			Single phase 220/230	6I6PV-2	0.6μF/450V
	25W	Single phase 110/115	8I25SV-1	6.5μF/250V		25W	Single phase 110/115	8I25PV-1	6.5μF/250V
		Single phase 220/230	8I25SV-2	1.5μF/450V			Single phase 220/230	8I25PV-2	1.5μF/450V
	40W	Single phase 110/115	9I40SV-1	10μF/250V		40W	Single phase 110/115	9I40PV-1	10μF/250V
		Single phase 220/230	9I40SV-2	2.5μF/450V			Single phase 220/230	9I40PV-2	2.5μF/450V
	60W	Single phase 110/115	9I60SV-1	18μF/250V		60W	Single phase 110/115	9I60PV-1	18μF/250V
		Single phase 220/230	9I60SV-2	4μF/450V			Single phase 220/230	9I60PV-2	4μF/450V
	90W	Single phase 110/115	9I90SV-1	20μF/250V		90W	Single phase 110/115	9I90PV-1	20μF/250V
		Single phase 220/230	9I90SV-2	6μF/450V			Single phase 220/230	9I90PV-2	6μF/450V
	135W	Single phase 110/115	9I135SV-1	27μF/250V		135W	Single phase 110/115	9I135PV-1	27μF/250V
		Single phase 220/230	9I135SV-2	8μF/450V			Single phase 220/230	9I135PV-2	8μF/450V

■Speed control motor--6R、8R、9R series

Shaft	Power	Voltage	Model	Capacitor	Shaft	Power	Voltage	Model	Capacitor
Round shaft	6W	Single phase 110/115	6R6SV-1	3.5μF/250V	Pinion shaft	6W	Single phase 110/115	6R6PV-1	3.5μF/250V
		Single phase 220/230	6R6SV-2	0.8μF/450V			Single phase 220/230	6R6PV-2	0.6μF/450V
	25W	Single phase 110/115	8R25SV-1	8μF/250V		25W	Single phase 110/115	8R25PV-1	8μF/250V
		Single phase	8R25SV-2	2μF/450V			Single phase	8R25PV-2	2μF/450V

		220/230					220/230		
	40W	Single phase 110/115	9R40SV-1	12μF/250V		40W	Single phase 110/115	9R40PV-1	12μF/250V
		Single phase 220/230	9R40SV-2	3.5μF/450V			Single phase 220/230	9R40PV-2	3.5μF/450V
	60W	Single phase 110/115	9R60SV-1	20μF/250V		60W	Single phase 110/115	9R60PV-1	20μF/250V
		Single phase 220/230	9R60SV-2	5μF/450V			Single phase 220/230	9R60PV-2	5μF/450V
	90W	Single phase 110/115	9R90SV-1	30μF/250V		90W	Single phase 110/115	9R90PV-1	30μF/250V
		Single phase 220/230	9R90SV-2	7μF/450V			Single phase 220/230	9R90PV-2	7μF/450V
	135W	Single phase 110/115	9R135SV-1	27μF/250V		135W	Single phase 110/115	9R135PV-1	27μF/250V
		Single phase 220/230	9R135SV-2	8μF/450V			Single phase 220/230	9R135PV-2	8μF/450V

2.3Speed control motor—Unit type

■Speed control motor—6I、8I、9I series

Shaft	Power	Voltage	Model	Capacitor	Shaft	Power	Voltage	Model	Capacitor
Round shaft	6W	Single phase 110/115	6I6SU-1	2.5μF/250V	Pinion shaft	6W	Single phase 110/115	6I6PU-1	2.5μF/250V
		Single phase 220/230	6I6SU-2	0.6μF/450V			Single phase 220/230	6I6PU-2	0.6μF/450V
	25W	Single phase 110/115	8I25SU-1	6.5μF/250V		25W	Single phase 110/115	8I25PU-1	6.5μF/250V
		Single phase 220/230	8I25SU-2	1.5μF/450V			Single phase 220/230	8I25PU-2	1.5μF/450V
	40W	Single phase 110/115	9I40SU-1	10μF/250V		40W	Single phase 110/115	9I40PU-1	10μF/250V
		Single phase 220/230	9I40SU-2	2.5μF/450V			Single phase 220/230	9I40PU-2	2.5μF/450V
	60W	Single phase 110/115	9I60SU-1	18μF/250V		60W	Single phase 110/115	9I60PU-1	18μF/250V
		Single phase 220/230	9I60SU-2	4μF/450V			Single phase 220/230	9I60PU-2	4μF/450V
	90W	Single phase 110/115	9I90SU-1	20μF/250V		90W	Single phase 110/115	9I90PU-1	20μF/250V

		Single phase 220/230	9I90SU-2	6μF/450V			Single phase 220/230	9I90PU-2	6μF/450V
	135W	Single phase 110/115	9I135SU-1	27μF/250V		135W	Single phase 110/115	9I135PU-1	27μF/250V
		Single phase 220/230	9I135SU-2	8μF/450V			Single phase 220/230	9I135PU-2	8μF/450V

■Speed control motor—6R、8R、9R series

Shaft	Power	Voltage	Model	Capacitor	Shaft	Power	Voltage	Model	Capacitor
Round shaft	6W	Single phase 110/115	6R6SU-1	3.5μF/250V	Pinion shaft	6W	Single phase 110/115	6R6PU-1	3.5μF/250V
		Single phase 220/230	6R6SU-2	0.8μF/450V			Single phase 220/230	6R6PU-2	0.6μF/450V
	25W	Single phase 110/115	8R25SU-1	8μF/250V		25W	Single phase 110/115	8R25PU-1	8μF/250V
		Single phase 220/230	8R25SU-2	2μF/450V			Single phase 220/230	8R25PU-2	2μF/450V
	40W	Single phase 110/115	9R40SU-1	12μF/250V		40W	Single phase 110/115	9R40PU-1	12μF/250V
		Single phase 220/230	9R40SU-2	3.5μF/450V			Single phase 220/230	9R40PU-2	3.5μF/450V
	60W	Single phase 110/115	9R60SU-1	20μF/250V		60W	Single phase 110/115	9R60PU-1	20μF/250V
		Single phase 220/230	9R60SU-2	5μF/450V			Single phase	9R60PU-2	5μF/450V

							220/230		
	90W	Single phase 110/115	9R90SU-1	30μF/250V		90W	Single phase 110/115	9R90PU-1	30μF/250V
		Single phase 220/230	9R90SU-2	7μF/450V			Single phase 220/230	9R90PU-2	7μF/450V
	135W	Single phase 110/115	9R135SU-1	27μF/250V		135W	Single phase 110/115	9R135PU-1	27μF/250V
		Single phase 220/230	9R135SU-2	8μF/450V			Single phase 220/230	9R135PU-2	8μF/450V

2.4Electromagnetic brake motor

■Electromagnetic brake motor—6R、8R、9R series

Shaft	Power	Voltage	Model	Capacitor	Shaft	Power	Voltage	Model	Capacitor
Round shaft	6W	Single phase 110/115	6R6S-1M	3.5μF/250V	Pinion shaft	6W	Single phase 110/115	6R6P-1M	3.5μF/250V
		Single phase 220/230	6R6S-2M	0.8μF/450V			Single phase 220/230	6R6P-2M	0.8μF/450V
		Three phase 230	6R6S-3M	—			Three phase 230	6R6S-3M	—
	25W	Single phase 110/115	8R25S-1M	8μF/250V		25W	Single phase 110/115	8R25P-1M	8μF/250V
		Single phase 220/230	8R25S-2M	2μF/450V			Single phase 220/230	8R25P-2M	2μF/450V
		Three phase 230	8I25S-3M	—			Three phase 230	8I25P-3M	—
	40W	Single phase 110/115	9R40S-1M	12μF/250V		40W	Single phase 110/115	9R40P-1M	12μF/250V
		Single phase	9R40S-2M	3.5μF/450V			Single	9R40P-2M	3.5μF/450V

		220/230					phase 220/230		
		Three phase 230	9I40S-3M	—			Three phase 230	9I40P-3M	—
	60W	Single phase 110/115	9R60S-1M	20μF/250V		60W	Single phase 110/115	9R60P-1M	20μF/250V
		Single phase 220/230	9R60S-2M	5μF/450V			Single phase 220/230	9R60P-2M	5μF/450V
		Three phase 230	9I60S-3M	—			Three phase 230	9I60P-3M	—
	90W	Single phase 110/115	9R90S-1M	30μF/250V		90W	Single phase 110/115	9R90P-1M	30μF/250V
		Single phase 220/230	9R90S-2M	7μF/450V			Single phase 220/230	9R90P-2M	7μF/450V
		Three phase 230	9I90S-3M	—			Three phase 230	9I90P-3M	—
	135W	Single phase 110/115	9R135S-1M	27μF/250V		135W	Single phase 110/115	9R135P-1M	27μF/250V
		Single phase 220/230	9R135S-2M	8μF/450V			Single phase 220/230	9R135P-2M	8μF/450V
		Three phase 230	9I135S-3M	—			Three phase 230	9I135P-3M	—

2.5 Torque motor

■Torque motor—6T、8T、9T series (The capacitor for 50/60Hz is the same)

Shaft	Power	Voltage	Model	Capacitor	Shaft	Power	Voltage	Model	Capacitor
Round shaft	3W	Single phase 110/115	6T3S-1	6.5μF/250V	Pinion shaft	3W	Single phase 110/115	6T3P-1	6.5μF/250V
		Single phase 220/230	6T3S-2	1.5μF/450V			Single phase 220/230	6T3P-2	1.5μF/450V
	10W	Single phase 110/115	8T10S-1	10μF/250V		10W	Single phase 110/115	8T10P-1	10μF/250V
		Single phase	8T10S-2	2.5μF/450V			Single phase	8T10P-2	2.5μF/450V

		220/230					220/230		
	20W	Single phase 110/115	9T20S-1	12μF/250V		20W	Single phase 110/115	9T20P-1	12μF/250V
		Single phase 220/230	9T20S-2	3μF/450V			Single phase 220/230	9T20P-2	3μF/450V
	40W	Single phase 110/115	9T40S-1	30μF/250V		40W	Single phase 110/115	9T40P-1	30μF/250V
		Single phase 220/230	9T40S-2	7μF/450V			Single phase 220/230	9T40P-2	7μF/450V

3.Installation

●Installation condition

Install the motor according to the following conditions.Use under other than these conditions may damaged the product.

(1) Indoor(the product is designed and manufactured to be mounted in a machine)

(2) Ambient temperature：-10~+40℃(no freezing)

(3) Ambient humidity ：Less than 85%(no condensation)

(4) No explosive,flammable,and/or corrosive gas.

(5) Not exposed to direct sunlight.

(6) Not exposed to dirt.

(7) Not exposed to moisture or oil.

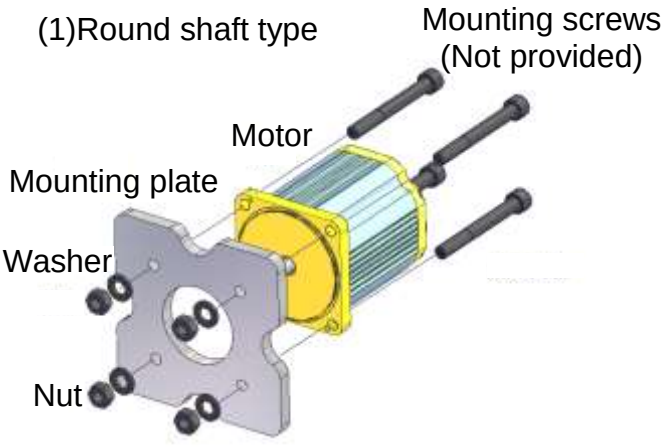
(8) Well ventilated and allows heat radiation.

(9) Does not receive continuous vibration or excessive shock.

3.1nstallation of the motor

Installation method vary according to motor output shaft style

(1)Round shaft type



■Drill holes on the mounting plate and mount the motor on the mounting plate.Using screws ,nuts and washers

(screws for attaching are not supplied)

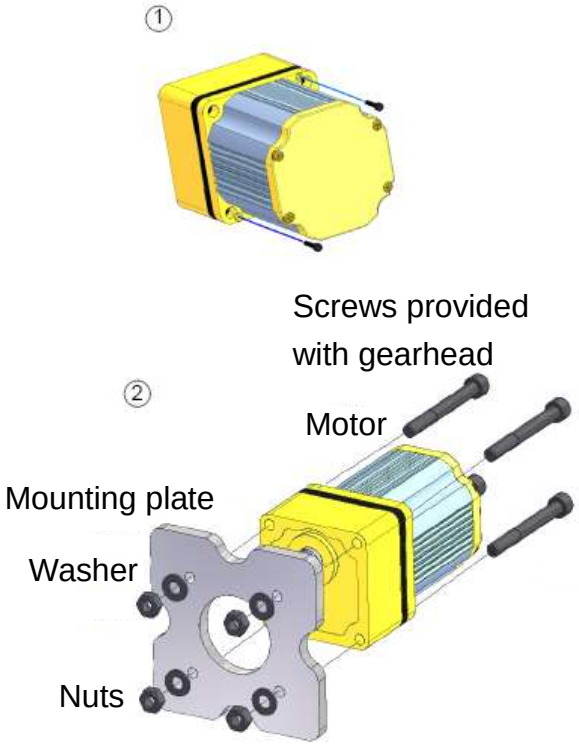
■Be careful not to leave a gap between the motor installation face and mounting plate.

Mounting screws

First letter of motor model name	Screw size
6I/6R/6T	M4P0.7
8I/8R/8T	M5P1.0
9I/9R/9T	M8P1.25

Note:Do not force the motor into the pilot hole of the mounting plate.If the holes don't match correctly the motor may be damaged.

(2)Pinion shaft type



Assembly:

■Align the gearhead and motor as the figure 2,then engage the pinion section of the shaft to gear gently by turning the gearhead slightly in both directions until the gearhead and motor fit flush together.

■Connecting the gearhead and motor using the screws provided with gearhead(M3P0.5x2pcs or M2P0.4x2pcs).

Note:Forcing the motor and gearhead together during assemble or permitting contamination by foreign matter inside the gearhead will cause excess noise and or shorter lift of the gearhead.

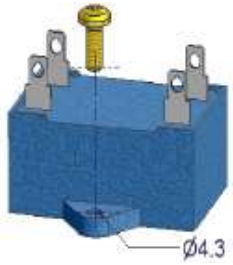
■Use the 4 pcs mounting screws provided with the gearhead to mount the motor and gearhead on the mounting plate.

Note:When mounting,do not leave the gap between the motor flange surface and gearhead.It will cause excess noise or gear may be damaged.

(3)Motor with cooling fan(60W/90W attached)

To install a motor with an intergrated cooling fan,provide 1 cm or more space at back of the fan cover to prevent blockage of cooling fan air inlet at the end of the motor,or provide a ventilation hole.

3.2Mounting the capacitor(For only single phase motors)



Before mounting the provided capacitor,check that the capacitance matches that stated on the motor's name plate.

Use the M4 screws to mount the capacitor(screws not provided)

Note:

●Do not let the screw fastening torque exceed 1Nm(10 Kgcm) to prevent damage to the mounting feet.

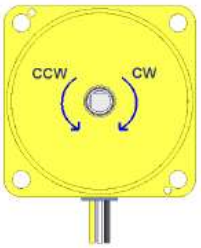
●Mount capacitor at least 10 cm away from motor.If it is located closer, the life of the capacitor will be shortened.

4.Connection and operation

●Connect the motor according to the "wiring diagram" shown below.

●Insulate all the wire connections,such as the connection between the motor and the capacitor connection.

◆Rotation direction

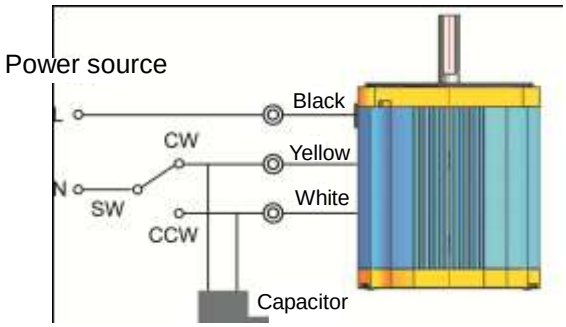


The direction of motor rotation is as viewed from motor output shaft side.
Clockwise direction is CW and counterclockwise direction is CCW.

◆Wiring diagram

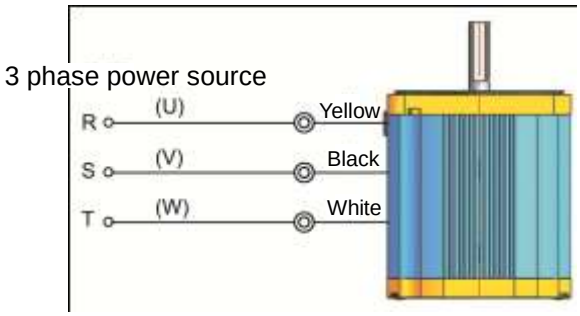
4.1 Induction/Reversible motor

【Single phase motors】



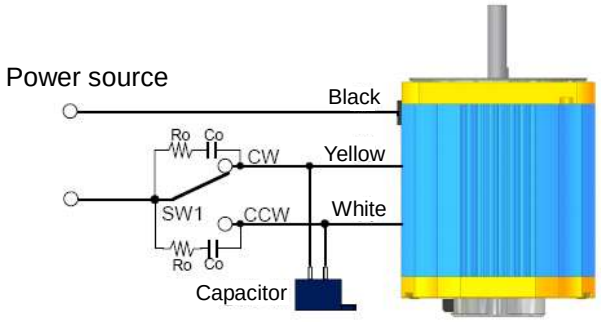
■Switching of the rotation direction:
To rotate the motor in a clockwise (CW) direction,flip switch SW to CW.
To rotate the motor in a counterclockwise (CCW) direction,flip switch SW to CCW.

【Three phase motors】



■Switching of the rotation direction:
To change the direction of rotation,change any two connections between U,V and W.Motor will rotate in a counterclockwise direction.

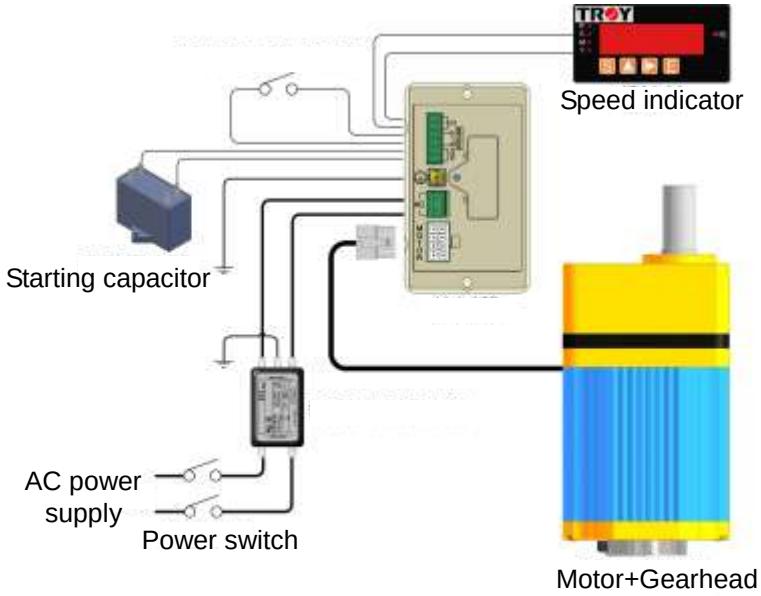
4.2 Speed control motor-Component type



■Switching of the rotation direction:
To rotate the motor in a clockwise (CW) direction,flip switch SW 1 to CW.
To rotate the motor in a counterclockwise (CCW) direction,flip switch SW 1 to CCW.

■For details please refer to the speed controller—TS31/32&TS31/32-HR.

4.3 Speed control motor-Unit type

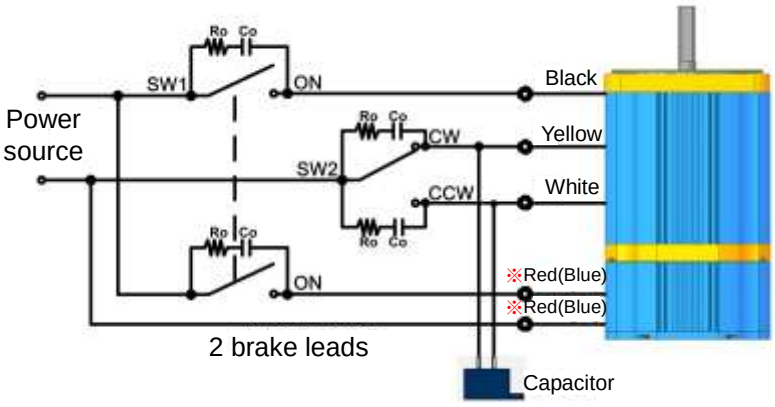


■Switching of the rotation direction:
To rotate the motor in a clockwise (CW) direction,flip the switch to CW.
To rotate the motor in a counterclockwise (CCW) direction,flip the switch to CCW.

■For details please refer to the speed controller—TU31/32&TUD31/32.

4.4 Electromagnetic brake motor

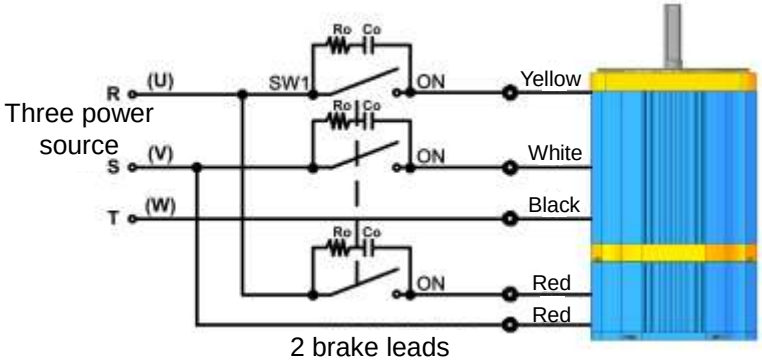
【Single phase motors】



■Switching of the rotation direction:
To rotate the motor in a clockwise (CW) direction,flip switch SW 1 to CW.
To rotate the motor in a counterclockwise (CCW) direction,flip switch SW 1 to CCW.

※The power voltage is 110/115V and the brake lead is blue.
The power voltage is 220/230V and the brake lead is red

【Three phase motors】



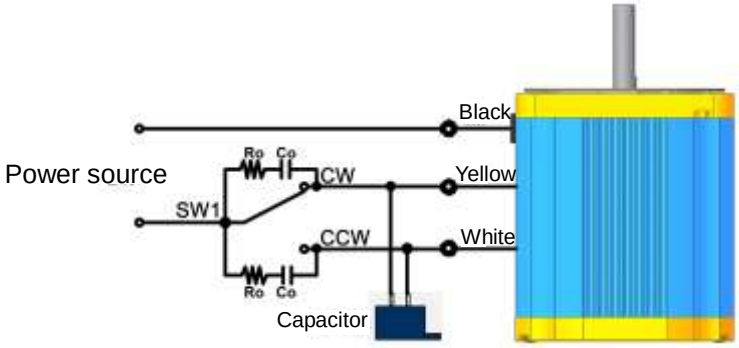
■Switching of the rotation direction:

To change the direction of rotation,change any two connections between U,V and W.Motor will rotate in a counterclockwise direction.

※The power voltage is 230/380V and the brake lead is red. Please connect with AC220-230V voltage of single phase.

4.5 Torque motors

【Standard wiring diagram】



■Switching of the rotation direction:

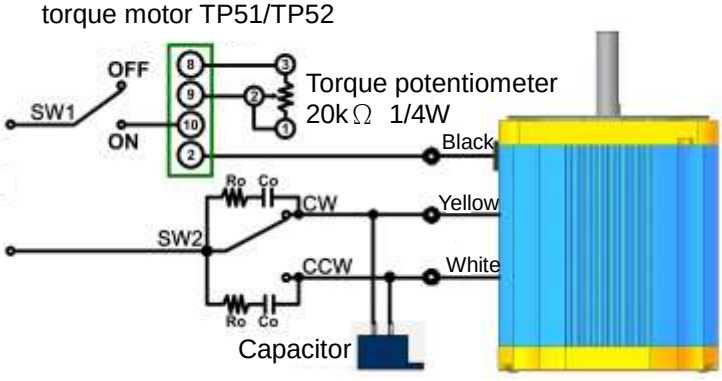
To rotate the motor in a clockwise (CW) direction,flip switch SW 1 to CW.

To rotate the motor in a counterclockwise (CCW) direction,flip switch SW 1 to CCW.

■It is easy to adjust the motor output torque via adjust power input

【Wiring diagram for power controller attached】

Power controller for torque motor TP51/TP52



■Torque motor can attach the power controller TP51/TP52 (Option) to adjust the torque and funtions.(For details please refer to the product's catalog or contact with your nearest local seller.)

■The application for control the tension operation and lock rotor operation which can adjust the torque potentiometer to adjust the motor output torque.

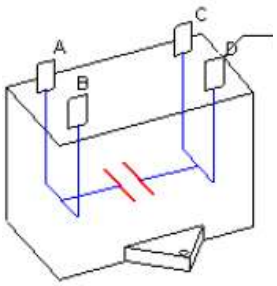
■Please confirm the motor input voltage is continuous duty or limit duty when adjust the motor output torque(Please refer to the 5.2)In case the over load caused the temperature rise and damage.

Please refer to the wiring diagram and test the power cable

【Black+Yellow】(CW rotation)

【Black+White】(CCW rotaion)

◆Capacitor connection(For only single phase motors)



AMP#187 series terminal

The capacitor internal wiring is as follows:
Capacitor terminals are internally electrically in twos;A-B and C-D for easy connection.
For easy to install terminals use AMP#187 series terminals.
For lead wire connection,use one lead wire for each individual terminal.

Note:

●Insulation class of this motor is F.The max permissible temperature of coil is 155℃

●Make sure that the motor case temperature does not exceed 90℃ during motor operation. Operation exceeding case temperature 90℃ may shorten the life of the coils and ball bearings .Motor case temperature can be measured by fastening a thermometer to the motor surface.It can also be measured using thermo tape or a thermocouple.

●To change rotation direction of the induction motor,wait until the motor completely stops.Otherwise its direction may not change or may take much time to change.

●Single phase motors and reversible motors use a capacitor and keep it connected even after rotation of the motor has started.

※Under the above the applications the motor time rating will difference because of the different input voltage.

5.Application and time rating

5.1Induction/Reversible motor、Speed control motor -Component type/Unit type、Electromagnetic brake motor

●Induction motors can be operated continuously(Continuous rating)

●Reversible motors designed for applications where instantaneous reversal of direction is frequently required.Reversible motors have a 30 minutes rating.(『30 min』is indicated on the name plate)

5.2Torque motor

●Speed adjust available:The motor torque is approximately proportional to the square of the voltage,allowing easy speed control simply by changing the voltage of the power supply.

●Suitable for constant tension winding applications:When object wound up and the diameter is getting bigger gradually.The motor output torque will decrease with the speed increasing which can achieve to the characteristic of constant speed and tension for winding.

●Locked rotor operation is available:Unlike induction motors or reversible motors,torque motor can provide a stable torque even under stall conditions or at very low speed(nearly stalling).

●When used the voltage at single phase (-1;60V) (-2;115V) or less,the motor can be operated continuously(Continuous rating)

●When used the voltage at single phase (-1;110V) (-2;220V),the motor have 5 minute rating(5 minute rating)

※Make sure the motor case temperature does not exceed the 90℃ during long time operation.

If the operation over the time rating please install the ventilation device.Such as fan…. Or making the force cooling measurement.

6.Troubleshooting

When the motor does not operate normally,check by referring to the table below.

If the motor does not operate normally even after checking,contact your nearest local seller for further information.

Phenomena	Check items
Motor does rotate or rotate slowly	1.Is supplied voltage appropriate? 2.Is the power source securely connected? 3.Is the load on the motor too much? 4.Is there a faulty contact on terminal blocks or crimped terminals if the cable is extended these methods? 5.For a single phase motor is the capacitor properly connected as per the "wiring diagram" shown in P.5 6.Is the motor case temperature exceed the 90℃(The built-in temperature switch activated and motor stop operation)
Motor sometimes rotates and stops	1.Is the power source securely connected? 2. Is there a faulty contact on terminal blocks or crimped terminals if the cable is extended these methods? 3. For a single phase motor is the capacitor properly connected as per the "wiring diagram" shown in P.5 4. Is the motor case temperature exceed the 90℃(The built-in temperature switch activated and motor stop operation)
Motor rotates in reverse direction	1.Is the motor connected differently than the"wiring diagram" shown in this manual.Check wiring by referring to the "wiring diagram" in P.3 2.The different gear ratio of gearhead and rotation direction of motor will different. 3. For a single phase motor is the capacitor properly connected as per the "wiring diagram" shown in P.5 4.Is any mistake of rotation direction of the motor is defined as viewed at the motor from shaft side?
Motor temperature abnormally high(Motor case temperature exceeds 90℃)	1.Is appropriate voltage applied to the motor? 2.Does ambient temperature exceed the specified range? 3.For single phase motor is the capacitor properly connected aas per the "wiring diagram" shown in P.5 4.Is the load on the motor too much?
Noisy operation	1.Are the motor and gearhead appropriately coupled? 2.Is the coupled gearhead the same pinion type as the motor shaft?

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※The product is subject to design modification for performance improvement without prior notice. For more details, please contact with your local seller.

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